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| 25944 7590 04/03/2008<br>OLIFF & BERRIDGE, PLC<br>P.O. BOX 320850<br>ALEXANDRIA, VA 22320-4850 |             |                      |                     |                  |
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| GUGLIOTTA, NICOLE T  |             |                      |                     |                  |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/531,873

**Applicant(s)**

UCHIDA ET AL.

**Examiner**

NICOLE T. GUGLIOTTA

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7, 9 - 11, 13 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7, 9 - 11, 13 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 7, 9, 10, 11, 13 and 14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 9 - 16 of copending Application No. 10/531,578. Although the conflicting claims are not identical, they are not patentably distinct from each other because both applications disclose the use of an alkali metal source, with a range of 0.01 – 10 parts by mass of alkali metal source with respect to 100 parts by mass of aggregate raw material. This application explicitly states the alkali metal source as the reinforcing material. Application No. 10/531,578 refers to "colloidal particles" as the reinforcing material.

However, the specification mentions an alkali metal source in the method of manufacture (Sections 0010 and 0033).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Objections***

2. Applicant is advised that should claims 9 or 13 be found allowable, claims 10 or 14, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP §706.03(k).

### ***Claim Rejections - 35 USC § 103***

3. Claims 7, 9, 10, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 2002/0180117 A1), in view of Kahlenberg et al. (Chemical News and Journal, July 15, 1898, pages 31 - 33), in further view of Noda et al. (U.S. Patent No. 7,041,358 B2).

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4. Yamamoto et al. teach a method of manufacturing a porous honeycomb structure by mixing and kneading raw materials, an organic binder, and an alkali metal source (Column 3, Lines 56 – 60), forming the material into the desirable honeycomb shape, calcinating, and then firing the honeycomb structure (Column 6, Lines 20 – 26). The raw materials may be made of SiC or Si<sub>3</sub>N<sub>4</sub> (Column 3, Lines 61 - 63). Yamamoto et al. teach the addition to this mixture an alkali metal source (referred to as the "vitrifying material"), such as sodium oxide, lithium oxide and potassium oxide (Column 4, Lines 49 – 54). The vitrifying material useable in the present process includes clay, *water glass*, a glaze, etc. (Column 4, Line 63 - Column 5, Line 3). Yamamoto et al. disclose the concentration range of an alkali metal source should be adjusted based upon the surface area of the particles (Column 5, Lines 4 – 37). In specific regard to claim 11, although Yamamoto et al. disclose a porous honeycomb microstructure, it does not contain pore-forming agent. Yamamoto et al. do not teach the specific use of potassium hydroxide and sodium hydroxide as the alkali metal source.
5. Kahlenberg et al. disclose the synthesis of alkali silicate (water glass) using sodium or potassium hydroxide (" $\text{Na}_2\text{SiO}_3 + \text{water} = 2\text{Na}^+, \text{OH}^- + \text{colloidal silicic acid}$ "). Tables IV. and V. show the behaviour of solutions of K<sub>2</sub>SiO<sub>3</sub> and KHSiO<sub>3</sub> respectively. What has been said of the sodium compounds applies also to these salts. (Page 31, Col.1, Line 5; Page 32, 2/3 down page; Page 33, last paragraph of article).
6. It would have been obvious to use waterglass in the Yamamoto et al. invention based on the Yamamoto et al. disclosure that waterglass can be used as a vitrifying agent. It would be obvious to use Kahlenberg's method of making waterglass because

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one reading the Yamamoto et al. patent would look to the prior art for guidance on making waterglass.

7. In regard to claims 7 and 11 in which the clay contains 0.01 to 1 parts by mass of the alkali metal source, claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art, *In re Boesch*, 205 USPQ 215 (CCPA 1980) (discovery of optimum of result effective variable in known process is ordinarily within the skill of art) and *In re Aller*, 105 USPQ 233(CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

8. Claims 7, 9, 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., in view of Kahlenberg et al., in further view of Stobbe et al. (U.S. 7,179,430 B1).

9. In claims 7 and 11, applicant claims a method of manufacturing a porous honeycomb structure by mixing an aggregate raw material comprising silicon and/or a non-oxide ceramic containing silicon. Applicant further defines those silicon materials to include silicon carbide, silicon nitride, and metal silicon (claims 9, 10, 13 and 14).

10. Yamamoto et al. teach the use of raw materials, such as SiC or Si<sub>3</sub>N<sub>4</sub>, in the manufacturing of a porous ceramic honeycomb structure. However, Yamamoto et al. do not disclose the use of pore forming agent.

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11. Stobbe et al. also teach a porous honeycomb microstructure containing pore-forming agent (Column 6, Lines 36 – 49). Like Yamamoto et al, Stobbe also teaches the use of raw materials, such as SiC or Si<sub>3</sub>N<sub>4</sub> (Column 5, Lines 30 – 33 and Column 7, Line 20).

12. It would have been obvious to one skilled in the art at the time the invention was made to add a pore forming agent to the slurry for a ceramic honeycomb to form a more porous honeycomb structure, which yields more efficient exhaust gas filtration.

13. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al., in view of Kahlenberg et al., in further view of Noda et al. (U.S. Patent No. 7,041,358 B2).

14. Yamamoto et al. disclose the amount of alkali metal source to be a result effective variable based upon surface area. However, neither Yamamoto et al., nor Kahlenberg et al., disclose 1 - 10 parts by mass of the alkali metal source.

15. Noda et al. (Column 5, Lines 41 – 48) teaches the preferable range of reinforcing material to be from 0.5 – 10 parts by mass when the total mass of the honeycomb structure before reinforcement is taken to be 100 parts per mass. Reinforcing materials include a composite oxide and an alkali metal, in the reinforcement areas portion (the end portions of the partition wall).

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16. It would be obvious to one skilled in the art at the time the invention was made to use alkali metal in the ceramic material in order to strengthen the ceramic structure and then to use a low concentration of alkali metal, such 0.5 – 10 parts by mass.

17. Claims 7, 9, 10, 11, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joulin et al. (U.S. Patent 6,582,796 B1) and Blount (U.S. Patent No. 4,824,807).

18. In regard to claims 7 and 11, Joulin et al. disclose 3- 30% by mass of at least one bonding ceramic phase (alkali metal source) in the form of a micronic powder and/or particles that are obtained by atomization, comprising at least one simple oxide that is selected from  $K_2O$ ,  $Li_2O$ ,  $Na_2O$  (Column 2, Lines 10 - 19), among other compounds, to a mix containing silicon carbide (Column 2, Lines 6 – 8) for making a ceramic honeycomb structure to be formed, dried and heated.

19. Blount discloses alkali silicate glass (water glass) is well known to be utilized as a binder, adhesive, coating agent and film (Column 1, Lines 13 - 15). Alkali silicates may be produced by any of the known methods such as fusing silica with alkali metal carbonates, alkali metal oxides, alkali metal hydroxides and/or alkali metal sulfates in the presence of carbon. The fused alkali metal silicate glass is preferred to be in a powdered form (Column 1, Lines 59 - 65).

20. It would have been obvious to one skilled in the art at the time the invention was made that water glass can be made by the addition of either alkali metal oxides of alkali



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metal hydroxides, based upon the disclosure of Blount. Therefore it would have been obvious to one skilled in the art at the time the invention was made for sodium oxides to be added as an alkali metal source, in the range of 3 - 30% by mass (equivalent to 3 - 30 parts by mass) in order to produce water glass within the slurry for reinforcement of the honeycomb structure.

21. In regard to claims 9, 10, 13, and 14, Joulin et al. (Column 2, Lines 6 – 8)

disclose the amount of silicon carbide to be as great as 97% by mass.

22. It would have been obvious to one skilled in the art at the time the invention was made to add an alkali oxide and silicon carbide to a ceramic honeycomb mixture, with the silicon carbide having a mass of 50% by mass or more, as suggested by Joulin et al.

### ***Response to Amendment***

23. The amendment filed January 8, 2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

24. First, Examiner finds no support for the amended claims 1 and 11 to have a lower endpoint of 1 part by mass and interprets amended claims to be teaching away from applicant's invention. Page 11, Line 9 of applicant's invention discloses a most

preferred embodiment of 0.03 to 1 parts by mass of the alkali metal source. In addition, each of applicant's examples disclosed in the specification contained less than 1 part by mass of the alkali metal source. There must be support for the specific endpoint values chosen. Therefore, Examiner finds no support in the original disclosure for a lower endpoint of 1 part by mass of alkali metal source and that this amended lower endpoint for alkali metal source teaches away from applicant's invention.

25. Second, Examiner finds no support for the amended claims 1 and 11 wherein the alkali metal source is selected from the group consisting of potassium hydroxide and sodium hydroxide. Examiner finds on page 10 "...and examples of the course include alkali metal inorganic salt such as oxide and hydroxide..." and on page 11..."A type of the alkali metal is not especially limited, and potassium or sodium is preferable."

Applicant is required to cancel the new matter in the reply to this Office Action.

### ***Response to Arguments***

26. **In regard to the double patenting rejection**, applicants argue because copending Application No. 10/531,578 has not issued, filing a Terminal Disclaimer to obviate a provisional double patenting rejection is premature. See MPEP 706.02(k). Applicants respectfully request abeyance of the double patenting rejection.

27. Examiner acknowledges a terminal disclaimer to obviate a provisional double patenting rejection is premature. Examiner maintains the rejection.

28. **In regard to the rejections under 35 U.S.C §103 over Yamamoto et al.**

29. First, applicants argue Yamamoto et al. do not disclose the newly added features of claims 7 and 11, specifically "the clay contains 1 to 10 parts by mass of the alkali metal source in terms of alkali metal with respect to 100 parts by mass of the aggregate raw material; and wherein in the alkali metal source is selected from the group consisting of potassium hydroxide and sodium hydroxide."

30. Examiner directs applicants to the new matter rejection and office action above due to the amended claims.

31. Second, applicants argue one of ordinary skill in the art would not have been motivated to specifically choose a vitrifying material that contains alkali metal, because Yamamoto et al. teach there is no particular restriction as to the kind of the vitrifying material so long as it melts at 1000°C or more and can form a vitreous material.

32. Examiner reminds applicant that it is not necessary for a reference emphasize particular embodiment over another in order for it to be considered obvious to one skilled in the art to use any of the embodiments. In addition, Yamamoto et al. suggest the use of water glass as a vitrifying agent. Water glass is an alkali silicate and therefore it would be obvious to one skilled in the art at the time the invention was made that an alkali metal should be used.

33. Third, applicants argue one of ordinary skill in the art would not have been motivated to specifically select potassium hydroxide or sodium hydroxide. Additionally,

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Yamamoto et al. do not teach or suggest the benefits of potassium hydroxide and sodium hydroxide as reinforcing agents.

34. Examiner directs applicants to the new matter rejection above. In addition, Yamamoto et al. disclose the use of water glass as a vitrifying agent and Kahlenberg et al. disclose a common process for making water glass (alkali silicates) includes the addition of alkali (sodium or potassium) hydroxides. See new rejection above based upon amended claims.

35. Yamamoto et al. teach the use of oxides such as  $\text{Na}_2\text{O}$  and  $\text{K}_2\text{O}$ . Examiner notes the chemical reaction of a metal oxide in an aqueous slurry yields hydroxides as the intermediate product (shown below) in the making of water glass with an alkali metal oxide, and therefore would consider it obvious to use hydroxides reinforcing agents based upon the disclosure of Yamamoto et al.

36.  $\text{Na}_2\text{O} + \text{H}_2\text{O} \rightarrow 2\text{Na}^+_{(\text{aq})} + 2\text{OH}^-_{(\text{aq})} \rightarrow \rightarrow \rightarrow \text{water glass}$

37. Fourth, applicants argue Yamamoto et al. disclose four examples wherein each example contains significantly more vitrifying material (and possible alkali metal) than that of claims 7 and 11. Yamamoto's Examples 1 – 4 have 15 - 35 weight percent of vitrifying material.

38. Examiner directs applicants to Yamamoto et al. Column 5, Lines 4 – 37 in which Yamamoto et al. disclose the concentration range of an alkali metal source is a result effective variable based upon the surface area of the particles. In addition, Noda et al.

is used in view of Yamamoto et al. to support the concentration range of alkali metal source used.

39. **In regard to the rejections under 35 U.S.C §103 over Yamamoto et al., in view of Stobbe.**

40. First, applicants note during the interview with Examiner Gugliotta and Supervisory Examiner Tarazano, the Examiners acknowledged that the rejection should have been presented as Yamamoto et al., in view of Stobbe.

41. Examiner apologizes for the mistake and appreciates applicants' clarification.

42. Second, applicants argue Stobbe does not cure the deficiencies of Yamamoto et al. Neither Yamamoto nor Stobbe, alone or in combination, teach or suggest each and every feature of claims 7 and 11. Claims 9, 10, 13 and 14 variously depend from claims 7 and 11 and thus, also would not have been rendered obvious by Yamamoto and Stobbe.

43. Examiner directs applicant to Examiner's arguments above for Yamamoto et al.

44. In regard to the rejections under 35 U.S.C §103 over Yamamoto et al., in view of Noda.

45. Applicants argue claims 8 and 12 are canceled, rendering their rejection moot.

46. Examiner notes the cancellation of claims 8 and 12.

**47. In regard to the rejections under 35 U.S.C §103 over Yamamoto et al., in view of Park.**

48. First, applicants argue in regard to claim 8 and 12, the claims have been canceled, rendering their rejection moot.

49. Examiner notes the cancellation of claims 8 and 12.

50. Second, applicants argue because neither Yamamoto nor Park, alone or in combination, teach each and every feature of claims 7 and 11, claims 7 and 11 would not have been rendered obvious by Yamamoto and Park. Claims 9, 10, 13 and 14 variously depend from claims 7 and 11 and, thus, also would not have been rendered obvious by Yamamoto and Park.

51. Examiner reminds applicant Park et al. was cited as evidence of the common use of water glass to enhance the strength of honeycomb monoliths after firing (Column 2, Lines 46 – 49). Park et al. further taught “the sodium silicate is desirably present in the extrudable mixture in an amount of up to about 7 parts, by weight, and more desirably in an amount from 2 to about 7 parts, by weight, based on the solids content of the sodium silicate (Column 6, Lines 43 – 53)”. Therefore, the alkali metal source of Park et al. was present in the amounts claimed by applicant. Examiner directs applicants to arguments made for previous references made in defense of Yamamoto et al. and Joulin et al.

**52. In regard to the rejections under 35 U.S.C §103 over Yamamoto et al., in view of Joulin.**

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53. First, applicants argue Joulin prefers 18 to 15% of a simple oxide that could be an alkaline metal. See Joulin at Col. 2, Lines 13 – 15.

54. Examiner directs applicants to Joulin Col., Lines 10 - 15. Joulin et al. discloses the honeycomb preferably has 18 - 15% by mass. However, the range of the bonding ceramic phase (i.e.  $K_2O$ ,  $Li_2O$ ,  $Na_2O$ ) may be as large as 3 – 30% by mass. Applicants' claimed range of 1 – 10% is within the range disclosed by Joulin et al. and would therefore it would be obvious to one skilled in the art at the time the invention was made for an alkali source to be within 3 - 30% by mass. Joulin's disclosure for the amount of alkali metal source in a porous honeycomb structure cures the deficiency applicant argues in Yamamoto et al.

55. Second, applicants argue neither Yamamoto nor Joulin, alone or in combination, teach or suggest each and every feature of claims 7 and 11. Claims 9, 10, 13 and 14 variously depend from claims 7 and 11 and, thus, also would not have been rendered obvious by Yamamoto and Joulin.

56. Examiner directs applicants to previous arguments in regard to both Yamamoto et al. and Joulin et al.

57. **In regard to the rejections under 35 U.S.C §103 over Yamamoto et al., in view of Domesle.**

58. Applicants argue Domesle does not cure the deficiencies of Yamamoto. Neither Yamamoto nor Domesle, alone or in combination, teach each and every feature of

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claims 7 and 11, claims 7 and 11 would not have been rendered obvious by Yamamoto and Domesle.

59. Examiner reminds applicant Domesle et al. was cited as further evidence for the common use of water glass in honeycomb structures used for exhaust gas filtration and directs applicants to arguments made for previous references made in defense of Yamamoto et al. and Joulin et al.

### ***Conclusion***

60. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE T. GUGLIOTTA whose telephone number is (571)270-1552. The examiner can normally be reached on M - Th 8:30 - 6 p.m., & every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICOLE T. GUGLIOTTA/  
Examiner  
Art Unit 1794

/Carol Chaney/  
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